

Dissociation of excitons in the C₆₀ film studied by transient photovoltage measurements

Xiaoyu Sun

Abstract

The dissociation of excitons at indium tin oxide (ITO)/C₆₀ interface is studied by means of transient photovoltage measurements. An abnormal polarity change of transient photovoltage from positive to negative upon pulsed laser irradiation is observed, indicating that the exciton dissociation at ITO/C₆₀ interface results in holes injected into ITO and electrons left in the C₆₀ film, opposite to that occurring at ITO/NPB and ITO/CuPc interfaces. It is confirmed that C₆₀ has a moderately strong ability of donating holes to ITO during the dissociation process of the excitons at the ITO/C₆₀ interface. Moreover the long term transient photovoltage ($t > 10\text{ns}$) and its polarity can be tuned by applying external bias on the device, which further proves the validity of the model proposed to explain the polarity change of the transient photovoltage.